

Health and cancer risks associated with low levels of alcohol consumption



The overall risks and harms resulting from alcohol consumption have been systematically assessed and are well documented. According to the latest WHO estimates,¹ alcohol consumption contributed to 3 million deaths in 2016 globally and was responsible for 5.1% of the global burden of disease and injury. Alcohol consumption is associated with an increased risk of many health conditions and is the main and sufficient cause for several disorders, including alcohol dependence, liver cirrhosis, and several other non-communicable diseases and mental health conditions. Alcohol use is among the leading risk factors for premature mortality and disability because of its causal relationship with multiple health conditions, which also include non-intentional injuries and suicides. Younger people are disproportionately affected by alcohol compared with older people, and 13.5% of all deaths among those aged 20–39 years are attributed to alcohol.¹ Disadvantaged and vulnerable populations have increased rates of alcohol-related death and hospitalisation.¹

Alcohol, as classified by the International Agency for Research on Cancer, is a toxic, psychoactive, and dependence-producing substance and a Group 1 carcinogen that is causally linked to seven types of cancer, including oesophagus, liver, colorectal, and breast cancers.² Alcohol consumption is associated with 740 000 new cancer cases each year globally.³

In the EU, light to moderate alcohol consumption (<20 g of pure alcohol per day, which is equivalent to consumption of approximately <1.5 L of wine [12% alcohol by volume; ABV], <3.5 L of beer [5% ABV], or <450 mL of spirits [40% ABV] per week) was associated with almost 23 000 new cancer cases in 2017, accounting for 13.3% of all alcohol-attributable cancers and for 2.3% of all cases of the seven alcohol-related cancer types.⁴ Almost half of these cancers (approximately 11 000 cases) were female breast cancers. Also, more than a third of the cancer cases attributed to light to moderate drinking (approximately 8500 cases) were associated with a light drinking level (<10 g per day).⁴

Increasing levels of alcohol use are associated with increasing levels of risk of illness and mortality,^{5,6}

leading to the question of whether a safe level of alcohol consumption that is associated with zero risk of health consequences can be defined. To identify a safe level of alcohol consumption, scientific evidence is required to show the absence of increased risk of illness or injury associated with alcohol consumption at and below that level. Some, but not all, studies have suggested that light alcohol consumption could have a small protective effect, as measured by the risk of some cardiovascular diseases or type 2 diabetes.^{7,8} Some studies show the existence of such effects on certain types of cardiovascular diseases in middle-aged and older people.⁹ However, several reviews also found that the protective effects of moderate consumption disappear with heavy episodic drinking, which increases the risk of any cardiovascular diseases.^{5,10}

No studies have shown that the potential existence of a protective effect for cardiovascular diseases or type 2 diabetes also reduces the risk of cancer for an individual consumer. Evidence does not indicate the existence of a particular threshold at which the carcinogenic effects of alcohol start to manifest in the human body. As such, no safe amount of alcohol consumption for cancers and health can be established. Alcohol consumers should be objectively informed about the risks of cancer and other health conditions associated with alcohol consumption.

We declare no competing interests. All authors are staff members of WHO. The authors alone are responsible for the views expressed here and these do not necessarily represent the decisions or the stated policy of WHO.

Copyright © 2022 World Health Organization; licensee Elsevier. This is an Open Access article published under the CC BY 3.0 IGO license which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. In any use of this article, there should be no suggestion that WHO endorses any specific organisation, products or services. The use of the WHO logo is not permitted. This notice should be preserved along with the article's original URL.

*Benjamin O Anderson, Nino Berdzuli, Andre Ilbawi, Dévora Kestel, Hans P Kluge, Rüdiger Krech, Bente Mikkelsen, *Maria Neufeld, Vladimir Poznyak, Dag Rekve, Slim Slama, Juan Tello, Carina Ferreira-Borges*
neufeld.maria@gmail.com

Department of Noncommunicable Diseases (BOA, AI, BM, SS), Department of Mental Health and Substance Use (DK, VP, DR), Health Promotion (RK, JT), WHO, Geneva, Switzerland; WHO Regional Office for Europe, Copenhagen, Denmark (NB, HPK); WHO European Office for the Prevention and Control of Noncommunicable Diseases, 125009 Moscow, Russia (MN, CF-B)

1 WHO. Global status report on alcohol and health 2018. World Health Organization. 2019 Feb 14. <https://apps.who.int/iris/handle/10665/274603> (accessed Dec 13, 2022).

- 2 Secretan B, Straif K, Baan R, et al. A review of human carcinogens—part E: tobacco, areca nut, alcohol, coal smoke, and salted fish. *Lancet Oncol* 2009; **10**: 1033–34.
- 3 Runggay H, Shield K, Charvat H, et al. Global burden of cancer in 2020 attributable to alcohol consumption: a population-based study. *Lancet Oncol* 2021; **22**: 1071–80.
- 4 Rovira P, Rehm J. Estimation of cancers caused by light to moderate alcohol consumption in the European Union. *Eur J Public Health* 2021; **31**: 591–96.
- 5 Rehm J, Gmel GE Sr, Gmel G, et al. The relationship between different dimensions of alcohol use and the burden of disease—an update. *Addiction* 2017; **112**: 968–1001.
- 6 Wood AM, Kaptoge S, Butterworth AS, et al. Risk thresholds for alcohol consumption: combined analysis of individual-participant data for 599 912 current drinkers in 83 prospective studies. *Lancet* 2018; **391**: 1513–23.
- 7 Ronksley PE, Brien SE, Turner BJ, Mukamal KJ, Ghali WA. Association of alcohol consumption with selected cardiovascular disease outcomes: a systematic review and meta-analysis. *BMJ* 2011; **342**: d671.
- 8 Schrieks IC, Heil AL, Hendriks HF, Mukamal KJ, Beulens JW. The effect of alcohol consumption on insulin sensitivity and glycemic status: a systematic review and meta-analysis of intervention studies. *Diabetes Care* 2015; **38**: 723–32.
- 9 GBD 2020 Alcohol Collaborators. Population-level risks of alcohol consumption by amount, geography, age, sex, and year: a systematic analysis for the Global Burden of Disease Study 2020. *Lancet* 2022; **400**: 185–235.
- 10 Roerecke M, Rehm J. Alcohol consumption, drinking patterns, and ischemic heart disease: a narrative review of meta-analyses and a systematic review and meta-analysis of the impact of heavy drinking occasions on risk for moderate drinkers. *BMC Med* 2014; **12**: 182.